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September 13, 1983

Mr. Richard Ferguson
Division of Solid and Hazardous Wastes
Minnesota Pollution Control Agency
1935 West County Road B-2
Roseville, Minnesota 55413

Dear Rick:

Pursuant to Allan Gebhard's letter of August 25, 1983 to Mr. Donald J. Thimsen/General Mills, Inc., we are moving ahead with the installation of four off-site Platteville/Carimona monitoring wells in the vicinity of the General Mills former laboratory disposal site. Enclosed are specifications sent to three geotechnical contractors, for soil borings/rock corings, and five well drilling contractors, for monitoring wells. Work is scheduled to begin October 3, 1983 and to be completed by October 31, 1983.

If you have any questions concerning these specifications, please contact me.

Sincerely,

Jane M. Willard

JMW/gbs
encl.

SPECIFICATIONS
FOR
SOIL BORING/ROCK CORINGS

IN VICINITY OF

GENERAL MILLS, INC.
FORMER LABORATORY WASTE DISPOSAL SITE
MINNEAPOLIS, MINNESOTA

September, 1983

BARR ENGINEERING CO.
Consulting Engineers
Minneapolis, Minnesota

SPECIFICATIONS

1. GENERAL

1.1 Scope of Work

The work included in these specifications consists of furnishing all labor, materials, equipment, transportation, and supplies for soil boring and rock coring as specified in these Specifications.

1.2 Protection of Site

The Contractor shall protect all structures, roads, etc. during the progress of the work and shall remove from the site all construction materials at the completion of the job.

1.3 Work by Others

The site shall be restored to its original condition, including sodding lawn areas after weather permits, by the well drilling contractor as stated in Section 2.8.

1.4 Access

Access for the work shall be as directed by the Owner.

1.5 Competent Workers

The Contractor shall employ only competent workers for the execution of the work, and all such work shall be performed under the direct supervision of or by an experienced driller.

The Contractor shall designate an employee who will be the Contractor's Authorized Representative on the site for the purpose

of receiving instructions from the Engineer or Owner and for keeping the Engineer informed of progress on the work and of any problems in carrying out the work in accordance with the Specifications.

The person so authorized by the Contractor shall retain full responsibility for safety on the job site in accordance with these Specifications. If, in the judgement of the Contractor's Authorized Representative on the site, any boring cannot be safely installed at the location designated by the Engineer, the Contractor shall immediately notify the Engineer and abstain from such work until another mutually agreeable location has been selected.

1.6 Construction Limits

The Engineer will determine the locations for the soil borings and stake the locations in the field.

The construction limits for the installation of the soil boring and monitoring well will be designated in the field by the Engineer. Any area disturbed by the Contractor outside of these limits shall, if so directed by the Engineer, be restored to its original condition at the Contractor's expense. The Contractor shall be liable for damages to any underground structures.

1.7 Subcontractors

The Contractor shall notify the Engineer in writing prior to the use of any Subcontractor on the project and describe the materials, equipment, and services provided by each Subcontractor. Nothing contained in the Contract Documents shall create any contractual relationship between any subcontractor and the Engineer.

1.8 Changes in Quantities

The Engineer reserves the right to increase or decrease, without limit, any of the quantities of materials, equipment, and services as set forth in the Form of Proposal without any changes in the unit prices proposed by the Contractor.

1.9 Codes and Permits

All work shall be done in accordance with Federal, state and local codes, statutes, and ordinances. Licenses and permits necessary for the execution of the work shall be secured by the Contractor.

As B-11 is located within a narrow boulevard along Como Avenue, special traffic control measures may be required by the City and/or County.

1.10 Safety

In accordance with generally accepted construction practices, the Contractor will be solely and completely responsible for conditions on the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours.

The duty of the Engineer is to conduct construction review of the Contractor's performance and is not intended to include review of the adequacy of the Contractor's safety measures, in or near the construction site.

The Contractor shall furnish all the Contractor's and Subcontractor's employees safety equipment, including but not limited to, hard hats, eye protection, respiration equipment where required, and all other protection devices needed to comply with the law or with accepted safety practices. The Contractor will be responsible for any safety violation and/or fine that may occur because of any

neglect by the Contractor, the Contractor's employees, or any third party under the Contractor's supervision.

The Contractor is reponsible for taking all precautions necessary to protect the safety of the Contractor's employees and equipment from any materials encountered during performance of the work and for cleaning and otherwise restoring any equipment used on the project to a suitable condition.

Water quality data from this site are available from the Minnesota Pollution Control Agency.

1.11 Payment

No partial payments may be made nor will any payment be made prior to completion of work according to Specifications and the receipt of the Contractor's report. Payment will be made within 10 days after the Engineer receives payment for the work herein described from the Owner. The Engineer agrees to submit an invoice to the Owner for all properly completed work within 30 days of receipt of a request for payment from the Contractor.

1.12 Contractor's Insurance

The Contractor shall secure and maintain the insurance required by the Owner that will protect the Contractor, the Contractor's Subcontractors, and the Owner and the Engineer, from claims under the Worker's Compensation Acts and from claims for bodily injury or property damage which may arise from the performance of the services under this agreement in the amounts listed below:

	Amount
Worker's Compensation	As Required for State of Minnesota
General Liability, Bodily Injury	$250,000/$500,000
Property Damage	$300,000/$500,000
Automobile Liability/Bodily Injury	$200,000/$500,000
Automobile Property Damage	$100,000
Excess Liability - Umbrella Form (Bodily Injury and Property Damage Combined)	$1,000,000

Certificates and/or copies of policies of such insurance shall be filed with the Engineer, and shall be subject to the Engineer's approval as to comfirmation with the requirements of the specifications. Said certificates of insurance shall contain a 30 day written notice of cancellation in favor of the Owner and Engineer.

1.13 Legal Relations

The Contractor and the Contractor's sureties shall save harmless the Engineer, Owner, and any and all of their officers, consultants, or employees from any claims and demands or losses, damages, costs, charges, and expenses of every nature and description, whether direct or indirect, because of the performance of the Contractor's work under this Agreement, including all injuries to workers or persons other than workers and for all property damages. The Contractor shall indemnify the Owner, and Engineer against any such loss or any liability of any nature, whether direct or indirect, and the Owner shall reserve the right to deduct from any money due to the Contractor the amount of any judgement or claim therefore.

2.0 SOIL BORINGS

2.1 Standard Specifications

Unless otherwise shown or specified, the work shall conform to the following current standards of the American Society for Testing and Materials.

1) ASTM D 1586-67 (1974) Penetration test and split-barrel sampling of soils.

2) ASTM D 1587-74 Thin-walled tube sampling of soils.

3) ASTM D 2488-69 (1975) Description of Soils (Visual-Manual Procedure).

4) ASTM D2113-70 (1976) Diamond core drilling for site investigation.

2.2 Soil Boring Locations

Figure 1 (attached) shows the preliminary locations of the four borings. The actual locations will be staked in the field by the Engineer. These locations may be adjusted by the Contractor as necessary to avoid obstructions or other conditions that are unsuitable for operation of drilling equipment. In no case, however, shall a boring be moved without approval of the Engineer.

2.3 Soil Boring Depths

The borings shall terminate approximately 3 feet into the Magnolia Member of the Platteville Formation. Total depth of the borings shall be determined by the Engineer in the field. Drilling and coring depths of each boring are estimated as follows:

Boring	Drilling in Overburden (ft.)	Coring of Decorah Shale (ft.)	Coring of Platteville Formation (ft.)	Total Drilling in Bedrock (ft.)
B-9	50	5	7	12
B-10	30	25	7	32
B-11	50	0	7	7
B-12	35	20	7	27

2.4 Soil Boring Advancement

The soil borings may be initially advanced by continuous flight hollow-stem auger to a depth of up to 15 feet. Upon encountering an obstruction in the glacial drift and with the approval of the Engineer, the hollow-stem auger shall be withdrawn and replaced with 6-inch diameter liner casing; drilling shall then resume using tricone rotary drilling methods with a drilling fluid composed of bentonite and potable water.

Once the boring encounters the subcropping bedrock, drilling shall stop. NW casing shall be installed and seated in the bedrock surface. Drilling shall then continue using NQ wireline drill coring methods. The drilling fluid shall consist of potable water only. Zones of water loss shall be carefully noted by the crew chief.

The core shall be removed from the hole at 5-foot intervals in the Decorah Shale. Upon encountering limestone, the core shall be removed in 2-foot intervals. At the time of core removal, the water level in the borehole shall be checked as stated in 2.7. The Engineer shall inspect the core to determine whether coring shall proceed an additional 2 feet.

Each section of the core collected shall be marked for interval, percent recovery, and orientation.

2.5 Soil Sampling

The sample shall be collected at 5-foot intervals and at every change in formation for the entire sequence of unconsolidated deposits. If an obstruction is encountered during sampling, the boring shall be deepened by an amount specified by the Engineer and the sampling procedure repeated.

All samples retained in the split-barrel sampler shall be placed in air-tight containers. Each container shall be marked with sample number, depth of sample, boring number and number of blows of a 140 pound hammer, freefalling 30 inches, to drive the sampler each 6-inch interval. All samples shall be preserved and delivered to Barr Engineering Co.

2.6 Obstructions

In the event that a boring is stopped by an obstruction, a new boring shall be started within 10 feet of the obstructed boring, if

directed by the Engineer. The Contractor shall properly abandon the obstructed boring as stated in 2.8.

2.7 Water Levels

Water levels shall be observed and recorded periodically during the progress of the boring in the limestone. The water levels shall be recorded after the level has stabilized. Water levels shall be measured and recorded after every rock core retrieval as stated in 2.4.

2.8 Borehole Abandonment

The portion of the borehole extending from the bottom of the borehole to a depth 2 feet above the observed water shall be filled with bentonite pellets. Previous work in this area indicates that the water table is 20 to 35 feet below the ground surface. Above the bentonite pellets, neat cement grout shall then be pumped through a tremie pipe into the borehole. The surface of the grout will always be above the discharge point of the tremie pipe.

Since the locations of the wells are in a residential section of Minneapolis, the Contractor shall use care to prevent the discharge or spill of water or drilling fluid in the vicinity of each boring. Excess grout from borehole abandonment shall be removed from site. The site shall be restored to its original condition, including sodding lawn areas after weather conditions permit, by the well drilling contractor. Original condition refers to the condition of the site prior to the work done by the geotechnical contractor as well as the work of the well drilling contractor.

2.9 Special Requirements

Due to the nature of the investigation, the following precautions shall be taken by the Contractor:

1. The drilling and water level measuring tools and devices shall be steam cleaned prior to mobilization.

2. No solvents or grease shall be used on the down-hole equipment during the project.

3. Smoking or chewing of tobacco shall not occur within 100 feet of the work area.

4. Neoprene or similar work gloves shall be used by the work crew and cleaned frequently.

5. Insect repellant of less than 100 percent active ingredient, hand lotion, or other volatile substances shall not be used within one hour of entering the work area nor while working in the work area.

6. Solvent-based writing instruments such as felt tip pens shall not be used.

3.0 REPORT

3.1 Field Logs

The Contractor shall maintain field logs of all relevant drilling and sampling data independent of the Engineer's field logs. Information contained in the Contractor's log shall include, but is not limited to, the following:

1. Boring number, location and date.
2. Type of equipment used.
3. Final depth of hole.
4. Soil sample number, depths, and soil descriptions and classifications.
5. Blow counts per each 6 inches of split-barrel sampler advanced.

6. Water levels.
7. Unusual drilling conditions.
8. Zones of water loss in bedrock coring.
9. Core recovery.
10. Observed standby time.

Upon completion of the borings, the Contractor shall furnish a copy of his field logs to the Engineer.

3.2 Report

The Contractor shall submit a report summarizing the drilling and subsurface information obtained from the borings within ten (10) calendar days from the completion of the borings. This report shall include final drilling logs of all borings containing the information as described in Section 3.1. No payment will be made to the Contractor until the Engineer is furnished with the Contractor's report.

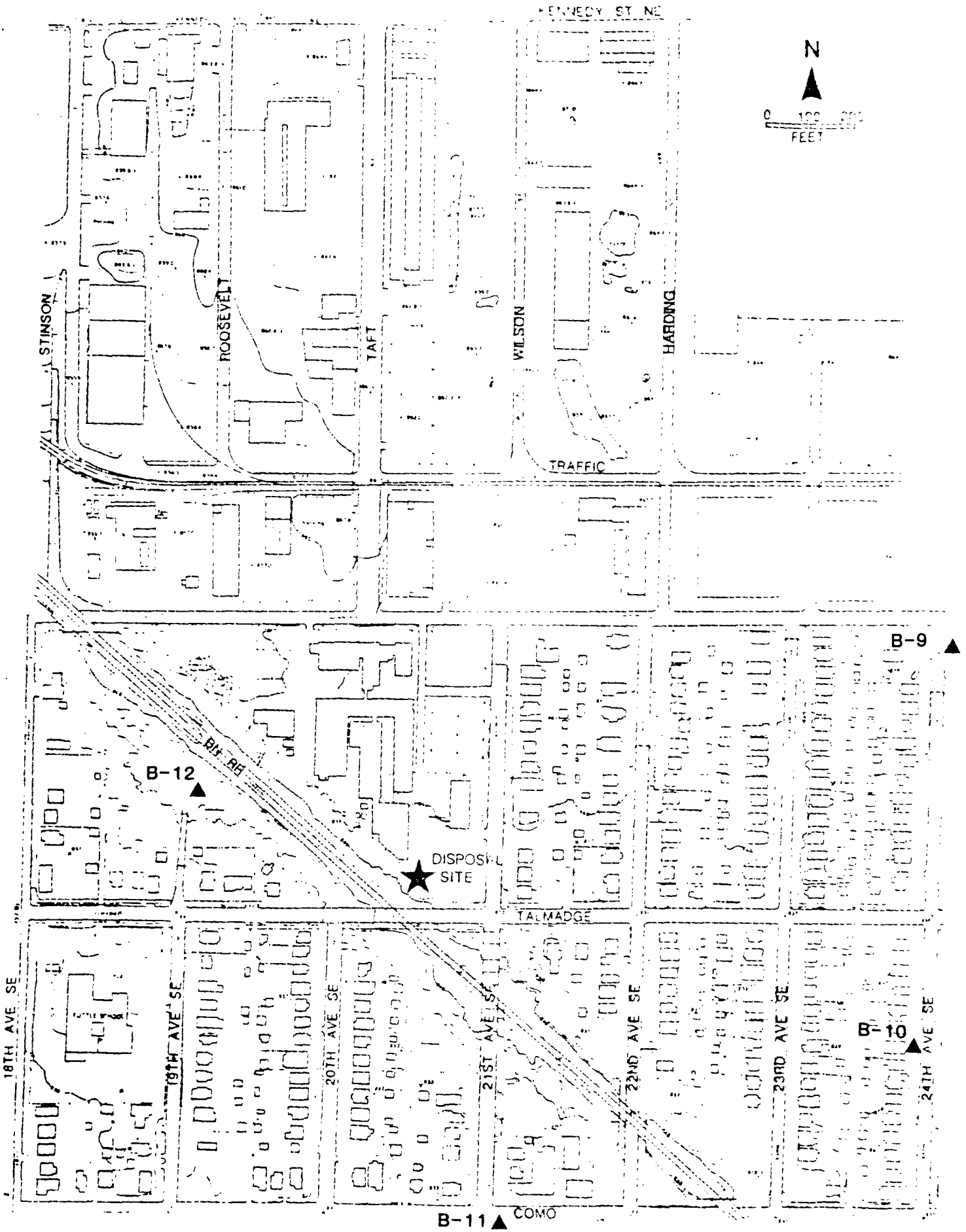

Figure 1

LOCATIONS OF BOREHOLES